What is claimed is:

1. A pulse valve (10) with a closing body (18) that cooperates with a valve seat (22) and, in a first switching position, establishes a flow connection between a supply channel (12) and a discharge channel (14) and, in a second switching position, blocks the flow connection, the closing body (18) periodically alternating between the two switching positions during the actuation of the pulse valve (10), its movement being hydraulically damped by a throttle point (70),
wherein
the hydraulic damping occurs only in a subrange of motion (62).

2. The pulse valve (10) as recited in Claim 1,
wherein
the throttle cross-section increases after the damped subrange (62) as the reciprocating motion (82) of the closing body (18) progresses.

3. The pulse valve (10) as recited in Claim 1,
wherein
a bypass (90) extending in parallel with the throttle point (70) is actuated to open along a subrange (64) of the reciprocating motion (82).

4. The pulse valve (10) as recited in Claim 2,
wherein
the closing body (18) is connected with a damping disk (54) provided in a damping cylinder (50) and forms, together with the damping cylinder (50), a throttle gap (70) around its circumference that expands in a subrange (64, 66) as the reciprocating motion of the closing body (18) progresses.

5. The pulse valve (10) as recited in Claim 4,
wherein
the damping cylinder (50) is open on an end face, and the damping disk (54) exits the damping cylinder (50) shortly before the end of the reciprocating motion of the closing body (18).

6. The pulse valve (10) as recited in Claim 4,
wherein
the flow cross section of the damping cylinder (50) expands continually at its open end.

7. The pulse valve (10) as recited in Claim 6,
wherein
the damping cylinder (50) includes an inner chamfer (68) at its open end.

8. The pulse valve (10) as recited in Claim 6,
wherein
the damping cylinder (50) includes at least one inner groove (72) and/or recess (74, 78) at its open end that expand in the direction toward the open end face.

9. The pulse valve (10) as recited in Claim 8,
wherein
the flanks of the groove (72) and the contour (76, 80) of the recess (74, 78) have a bent shape.

10. The pulse valve (10) as recited in Claim 4,
wherein
the damping cylinder (50) includes an inner annular groove (84), the width of which is greater than the thickness of the damping disk (50) at its circumference.

11. The pulse valve (10) as recited in Claim 10,
wherein
the flanks of the annular groove (84) are transition regions (66).

12. The pulse valve (10) as recited in one of the preceding Claims,
wherein
the damping disk (54) includes an axially projecting edge (88) around its circumference.

13. The pulse valve (10) as recited in one of the preceding Claims,
wherein
the damping disk (54) has a surface is not circular.

14. The pulse valve (10) as recited in one of the preceding Claims, wherein the damping disk (54) is very thin and has a fine, perforated structure.

15. The pulse valve (10) as recited in Claim 14, wherein the cross section of the holes (94) is in the micrometer range.

16. The pulse valve (10) as recited in Claim 1, wherein the hydraulic throttling is produced via a fluid-permeable diaphragm (96) that is connected around its circumference with the valve housing (16), while its central region is carried along in the direction of the reciprocating motion (82) by the valve stem (26) or a rod (56) connected therewith.

17. The pulse valve (10) as recited in Claim 16, wherein the diaphragm (96) is semi-rigid and elastic.

18. The pulse valve (10) as recited in Claim 16, wherein the elasticity properties of the diaphragm (96) are matched to the desired damping characteristics of the closing body (18).

19. The pulse valve (10) as recited in Claim 14, wherein the diaphragm (96) has a fine-meshed network structure or woven structure.

20. The pulse valve (10) as recited in Claim 14, wherein the cross section of the mesh is in the micrometer range.

21. The pulse valve (10) as recited in one of the Claims 16 through 20, wherein the diaphragm (96) is made of a composite material.

22. The pulse valve (10) as recited in one of the preceding Claims, wherein the undamped part (64) of the reciprocating motion (82) is formed by a passage (98, 100) between the valve stem (26) or the rods (56) connected therewith and the damping disk (54) and the diaphragm (96).

23. The pulse valve (10) as recited in one of the preceding Claims, wherein the damping disk (54) and the diaphragm (96) are coaxial with the valve stem (26) in the direction of flow in front of or behind the closing body (18).

24. The pulse valve (10) as recited in one of the preceding Claims, wherein the surface of the damping disk (54) or the diaphragm (96) is larger than the cross section of the closing body (18).